



Appl. No. 10/042,626  
Amdt. Dated July 22, 2004  
Reply to Office action of Aug. 17, 2004

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GROUP 3600

**Amendments to the Claims: (Clean copy)**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**What is claimed is:**

1. A total design system for planet-type roller gears, also known as cyclo gear torque multiplier, comprising:  
basic geometrical relationships evolving around the “cyclo module”, the radius, “R” of the cyclo tooth, with simplifications and improvements of the cyclo gear axis and its control and including a backlash-free, constantly powered rotary encoder with an anti-hunting vibration circuit for better positioning and improved longevity.
2. A geometric design arrangement for planet type roller gear according to claim 1, wherein the roller radius has the given relation to the cyclo-module as shown in FIG. 1.9.
3. A geometric design arrangement for planet type roller gears to claim 2, wherein the roller size R, the roll-up diameter D2, provide the three tangent points to generate the tooth cup radius “r” of the cyclo disk as illustrated under Figure 1.9 and Table 2.
4. A geometric design arrangement for planet type roller gears according to claim 3, wherein the eccentric has a geometrical relation to the cyclo module as shown in Figure 1.9 and Table 2.
5. A geometric design arrangement for planet type roller gears according to claim 4, wherein the wave disk has a geometric relation to claim 2 and 3 and Figure 1.9 and Table 2.
6. A geometric design arrangement for planet type roller gears according to claim 5,

wherein three eccentrics are indexed equally around the center as shown in drawings

Figure 1.1, 1.2, 1.8, 1.10.

7. A geometric design arrangement for planet type roller gears according to claim 6, wherein the number of eccentrics shown are 1, 2, or 3 as drawn in Figure 2.1, 2.2, 2.3.
8. A geometric design arrangement for planet type roller gears according to claim 7, wherein the eccentrics are spaced to drive the high torque generated by the cyclo gear and wave disk in connection with the containing flanges as shown in Figure 1.1, 1.2.
9. A geometric design arrangement for planet type roller gears according to claim 8, wherein the two drive-out flanges are driven by the eccentrics play-free bearings as shown in Figure 1. . 2 . .
10. A geometric design arrangement for planet type roller gears according to claim 9, wherein flange and housing bearings form a complete unit axis-cyclo-gear-assembly with taped mounting holes, as shown in Figure 1.1, 1.2.
11. A geometric design arrangement for planet type roller gears according to claim 10, wherein six hollow torque stabilizing bars with sleeves, stabilize the two drive-out flanges as shown in Figures 2.1, 2.2, 2.3.
12. A geometric design arrangement for planet type roller gears according to claim 11, wherein a pair of deep groove or cross-roller bearing is used to stabilize the high torque flange to the gear housing, as in Figures 1.1, 2.1, 2.2, 2.3, to make the gear assembly an axis or turntable.
13. A geometric design arrangement for planet type roller gears according to claim 12, wherein all cyclo rollers are reset or hallowed and pinned as shown in Figure 2.1, 2.2, 2.3.
14. A geometric design arrangement for planet type roller gears according to claims 1, through 13 wherein the rotating position is further enhanced by controlling its position at any time by adding an absolute shaft encoder to the gear axis drive-in as shown on Figure 5.

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15. A geometric design arrangement for planet type roller gears according to claim 14, wherein a two channel absolute angular encoder with up/down counter is continuously powered to make it an absolute position smart axis as shown on FIG. 5.
16. A geometric design arrangement for planet type roller gears according to claim 15, wherein the analog summing circuits and feedback servo circuit may feed back data misdirecting the summing results and servo action, the Figure 3 frequency and servo filter counteracts extraneous signals and enhances further the productivity and performance of the cyclo torque multiplier and cyclo gear axis as shown in Figure 4.

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